

Mosquitoes, fleas and ticks are annoying insects that can occasionally spread illness when they bite. When properly used, insect repellents can keep insects from biting you. Unlike sunscreen products (that are designed for generous, frequent use), insect repellents are intended for limited, occasional use.

While DEET is a recommended, effective chemical repellent for bite prevention, using it or other repellents is not the only way to avoid bites.

#### Other ways to avoid insect bites include:

- **Wear clothing with long pants and long sleeves** while outdoors. Tuck pants into boots or socks.
- **Use mosquito netting** over infant carriers and outdoor eating and sleeping areas.
- **Be sure doors and windows stay closed or are properly screened.** Screens should not have holes or rips large enough for insects to enter. If your house or apartment does not have screens, a quick solution may be to staple or tack screening (available from hardware stores) across the windows.
- **Stay inside or avoid likely habitats** (wooded, humid areas or near rivers or other bodies of water) and **mosquito times** (early evening and morning hours).
- **Visit your veterinarian** if your pets have ticks or fleas.
- **Reduce the number of biters** in the area by getting rid of standing water and high grass or weeds that provide breeding places and harborage.

#### How do repellents work?

Many insects bite people or animals to get blood to grow or to make eggs. These insects are attracted to us by our movement, body odors, heat and moisture. Many insect repellents (including DEET) contain chemicals that do not kill bugs, but make us “invisible” or unattractive to biting insects. Repellents are only effective at short distances, so although you have plenty of repellent on, you may still see mosquitoes flying nearby.

#### Itching for a Repellent?

##### Things to consider when choosing repellents:

- **Plan to follow the directions carefully.**  
Insect repellents are pesticides and improper use has been linked to serious illness. Read the directions each time, even if you’ve used the product before. Use only the amount directed, at the time and under the conditions stated, and for the purpose listed. Repellents that also list a sunscreen should be used like a repellent—apply only when needed and as little as possible to keep you from being bitten. If you need sun protection, buy a separate sunscreen.
- **The type of pest.**  
For example, if you need a tick repellent, make sure that the product label lists this use. If ticks are not listed, the product will probably not work for ticks.
- **Where are you going?**  
Some areas (such as wetlands, hiking trails, shaded woods) usually have a higher number of biting insects and a greater need for repellents than other areas (like shopping malls, front yards, and city centers).
- **Use the lowest effective concentration available.**  
When it comes to repellent, more is not usually better. It is safer to *use the lowest concentration* of repellent that keeps you from being bitten. For example, the recommended DEET concentration for adults is **less than 30%**.
- **How often are you bitten?** Many insects use chemical sensors to find a meal. Some people are more “attractive” to insects than others. For example, mosquitoes seem to prefer blondes over brunettes, children over adults, and people that breathe or sweat more often than other people.
- **EPA label.**  
Check the container to make sure that the product is EPA-approved. The label will tell you the active ingredient (what’s keeping the bugs away) as well as the directions for use.



#### Did you know???

Insect repellents are supposed to stink. Sometimes the bugs don’t like the smell, but another reason is the EPA. In 1975, the EPA declared that pesticides with food-like fragrances were not allowed to be registered because they might be overused or too attractive for children. Fragrances that don’t smell like food, such as pine and floral, are still allowed to be used.

#### Insect repellent tips

##### Follow the application instructions on the product.

Using more than the specified amount won’t give you extra protection, but may increase irritation from the repellent.

Use repellents sparingly. Heavy applications are not necessary for bite prevention.

##### Keep repellent out of your eyes, mouth, or broken skin (cuts, blisters and sunburns).

These spots are pathways into your body. Also use sparingly around your ears.

**Breathe clean air.** Repellents can irritate your lungs. Do not spray the repellent while in a tent, other confined space, or windy area. If using a spray—spray the product on your hands and then rub it on your face.

**Apply, spray and store repellents away from food.** Wash your hands after applying repellent.

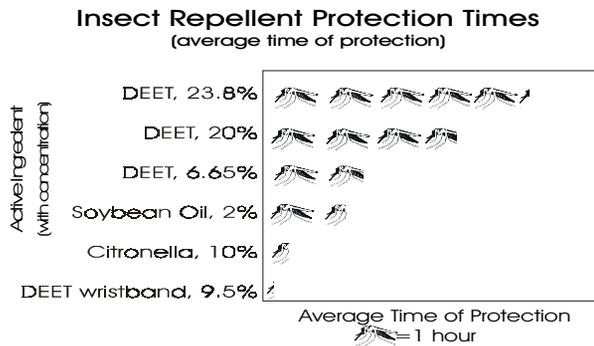
**Only apply repellent to exposed skin.** Applying repellent under clothing can speed its absorption into your body. If you spray your clothes, wash them before wearing again to reduce your exposure to the chemical. DEET generally doesn’t harm cotton, nylon, or wool, but it can damage some synthetics such as rayon, acetate, and spandex, along with plastic eyeglasses, watch crystals and leather or vinyl car seats.

**Wash the repellent off** your skin when you come inside or no longer need protection.

##### Be extra careful with young children.

- Protect babies and children under 2 years old by keeping them away from insects instead of using a chemical repellent.
- For children 2-12, use no more than a 10% solution of DEET.
- Even if the container says “Safe for Kids” don’t let a young child (under the age of 10) apply or handle the product.
- Be careful not to apply repellent on a child’s hands (to keep the chemical out of the eyes and mouth).
- If using a spray, spray your own hands and then rub repellent on the child. Wash your hands before you handle food.
- Wash the repellent off with soap and water when you come inside or no longer need protection.

**How long do repellents work?** A 2002 report in The New England Journal of Medicine listed the protection time of several insect repellents against mosquito bites.<sup>1</sup>



**How often should repellent be applied?** Follow the directions on the product to determine how often you need to reapply repellent. Getting wet or sweating may mean that you need to put repellent on more often, but do not exceed the total number of applications listed (for example, 3 applications per day). **If you are not being bitten, you do not need to reapply repellent.**

**Concerns About DEET.** DEET (chemical name, N,N-diethyl-meta-toluamide) is the active ingredient in many insect repellent products. Products containing DEET are available as liquids, lotions, sprays, and impregnated materials (eg. wrist bands) at concentrations ranging from 4 to 100% DEET.

DEET was developed by the U.S. Army in 1946, and was registered for public use in 1957. In rare cases, use of DEET products has caused skin irritation, blisters, lip numbness or more severe reactions. If you suspect a reaction to DEET or any other product, stop using it, wash the skin, and call the poison control center at 1-800-222-1222 or go to the doctor. Keep the product with you to give the doctor or poison control.

Serious reactions to products containing DEET are usually related to misusing the product (such as extended use of high concentrations, swallowing, using on broken skin, or using for several days without washing).

**ALWAYS FOLLOW THE DIRECTIONS ON THE LABEL**

**Q. What are some symptoms of repellent reaction?**

**A.** When used according to directions, DEET and other licensed insect repellents have a safe use record. However, some people may have reactions to repellents. Symptoms of reported reactions are usually linked to improper use and include: tingling skin (especially in the face), reddened skin, and a stuffy or runny nose. Wheezing, sneezing, and shortness of breath have also been reported. Eye exposures may result in corneal damage and significant ingestions have caused seizures. Contact your doctor if you have symptoms or questions.

**Q. What about pyrethrins?**

**A.** Pyrethroid insecticides (such as permethrin) are used to kill insects. They are often used in foggers, bug bombs, animal products (like flea shampoos and collars), and sprays. Pyrethroid insecticides are NOT TO BE used on human skin, but depending on the product can be sprayed on surfaces such as clothing or tents. The chemical usually lasts for several washings.

**Plants as repellents**

Many plants have been reported to repel insects. These plants include: citronella, cedar, pine, verbena, basil, geranium, lavender, cinnamon, rosemary, thyme, allspice, garlic, and peppermint.

When tested, most of these plant products usually give short-lasting protection ranging from a few seconds to less than 2 hours.

**For more information contact:**

**Benton-Franklin Health District**  
Environmental Health Division  
800 W. Canal Dr.  
Kennewick, WA 99336  
509.582.7761 ext. 246  
[www.bfhd.wa.gov](http://www.bfhd.wa.gov)

**Other BFHD brochures:**  
West Nile Virus  
Ticks and Lyme Disease

**Environmental Protection Agency**  
[www.epa.gov](http://www.epa.gov)  
[www.epa.gov/pesticides](http://www.epa.gov/pesticides)

**National Pesticide Information Center**  
<http://npic.orst.edu> 1-800-858-7378  
<http://npic.orst.edu/factsheets/DEETgen.pdf>

**The Pesticide Management Education Program at Cornell University**  
<http://pmep.cce.cornell.edu>

<sup>1</sup>Fradin M, and Day J. Comparative Efficacy of Insect Repellents against Mosquito Bites. New Eng J Med 2002; 347:13-18.)

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# Bite Back

outdoor safety series

## Using Insect Repellents Safely



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